

Docket No.: 199866US2CRL



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION: Andrew J. SHIELDS et al.

SERIAL NO.: 09/713,242

GAU: 2878

FILED: November 16, 2000

EXAMINER: MONBLEAU, D. N.

FOR: A PHOTON SOURCE

LETTER SUBMITTING REPLACEMENT DRAWING SHEET(S)

COMMISSIONER FOR PATENTS
Alexandria, VA 22313

SIR:

Responsive to the below indicated communication, the following drawing sheets are submitted herewith:

☒ 27 Replacement Drawing Sheets ☐ _____ New Drawing Sheets

☒ Official Action dated November 21, 2003

☐ Notice of Allowance/Issue Fee dated _____

☐ Other dated _____

The changes and/or modifications made include the following:

The figures have been positioned within the required spacing.

Respectfully submitted,

Eckhard H. Kuesters

Registration No. 28,870

Customer Number

22850

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(OSMMN 05/2003)

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IN THE DRAWINGS

The attached sheets of drawings include changes to Figures 1-29. These sheets, which include Figures 1-29, replace the original sheets including Figures 1-29.

Attachment: Replacement Sheets



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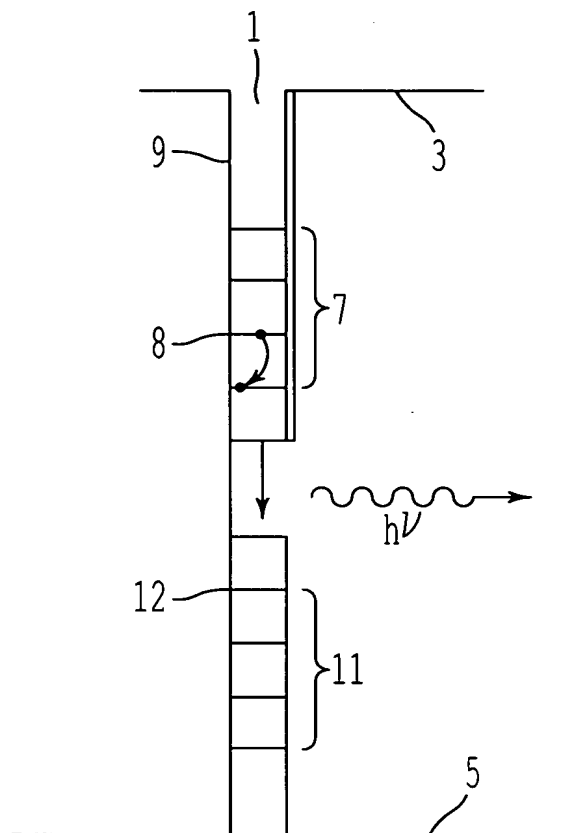


FIG. 1

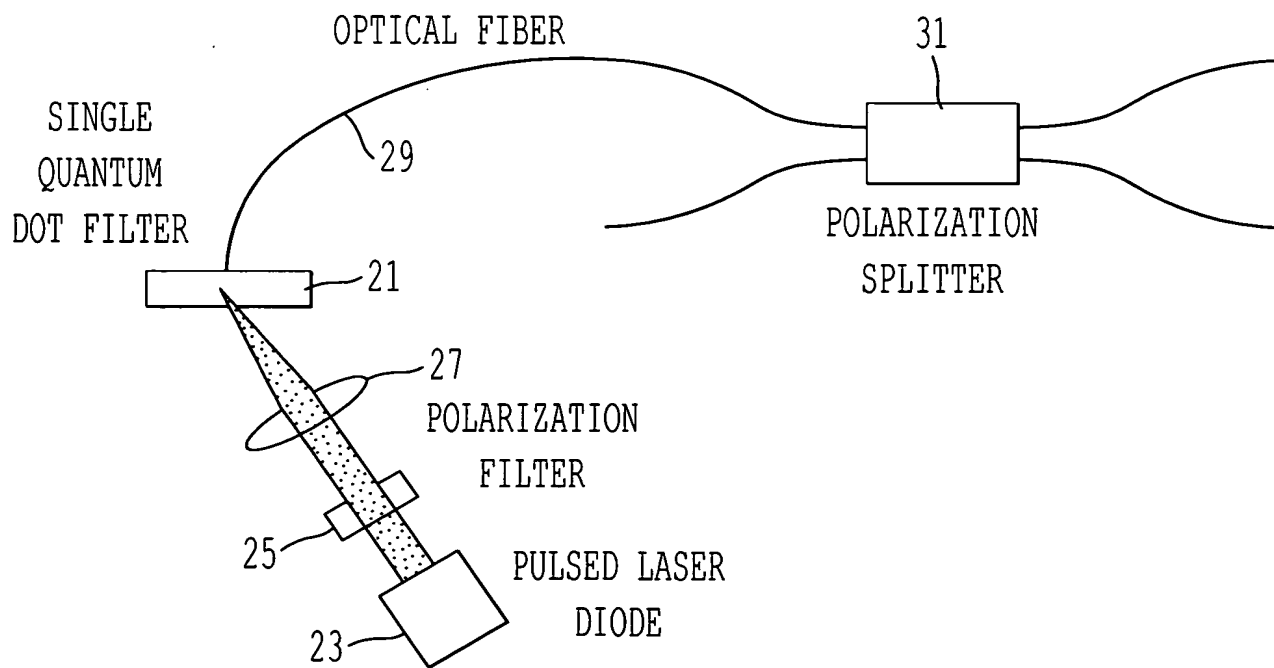


FIG. 2

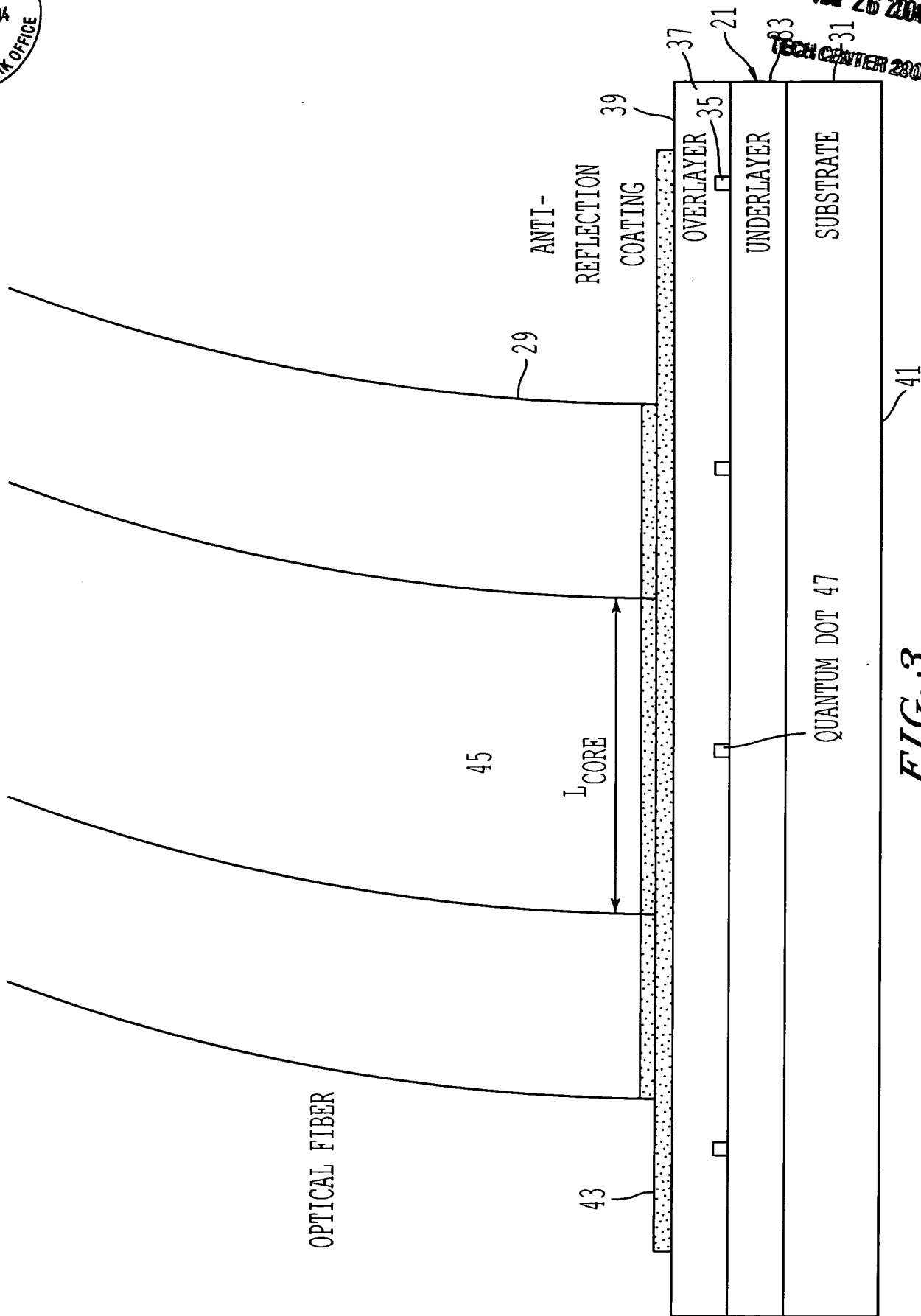


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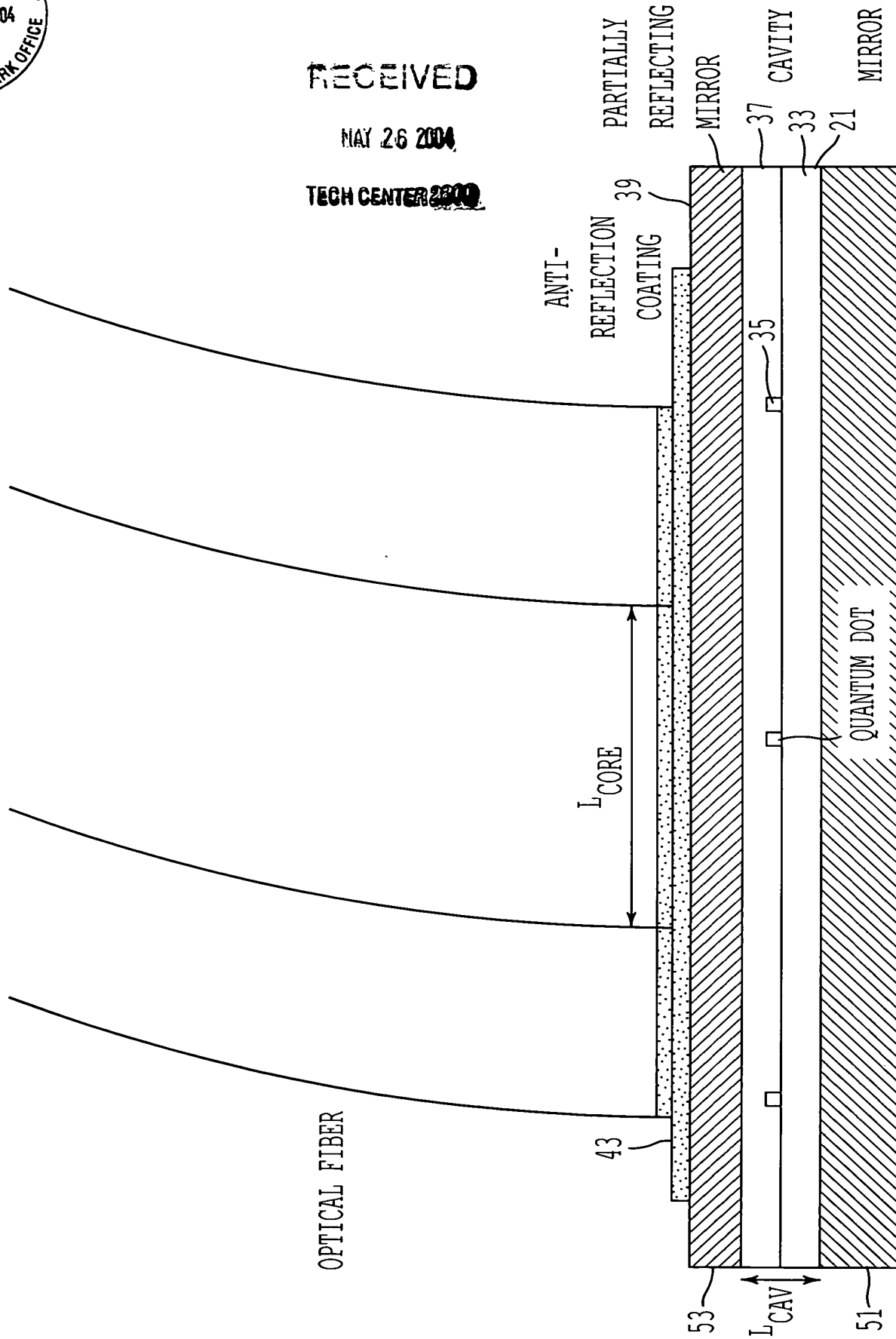


FIG. 4



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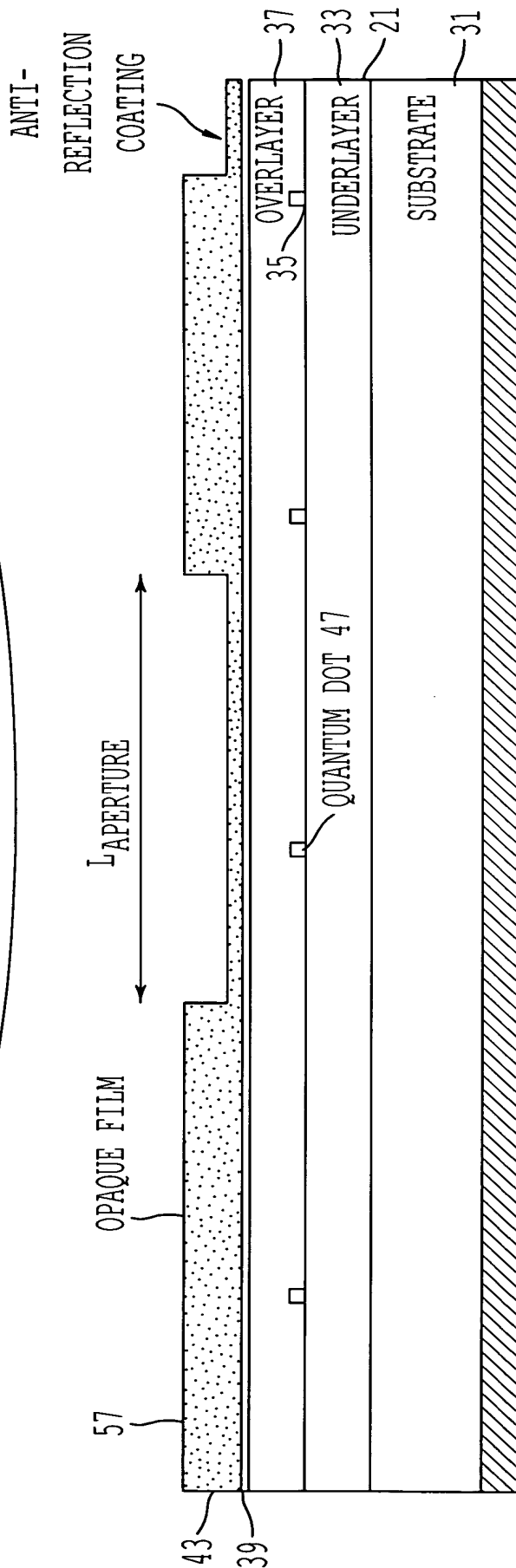
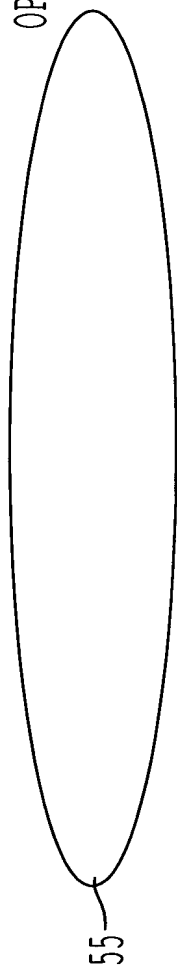


FIG. 5



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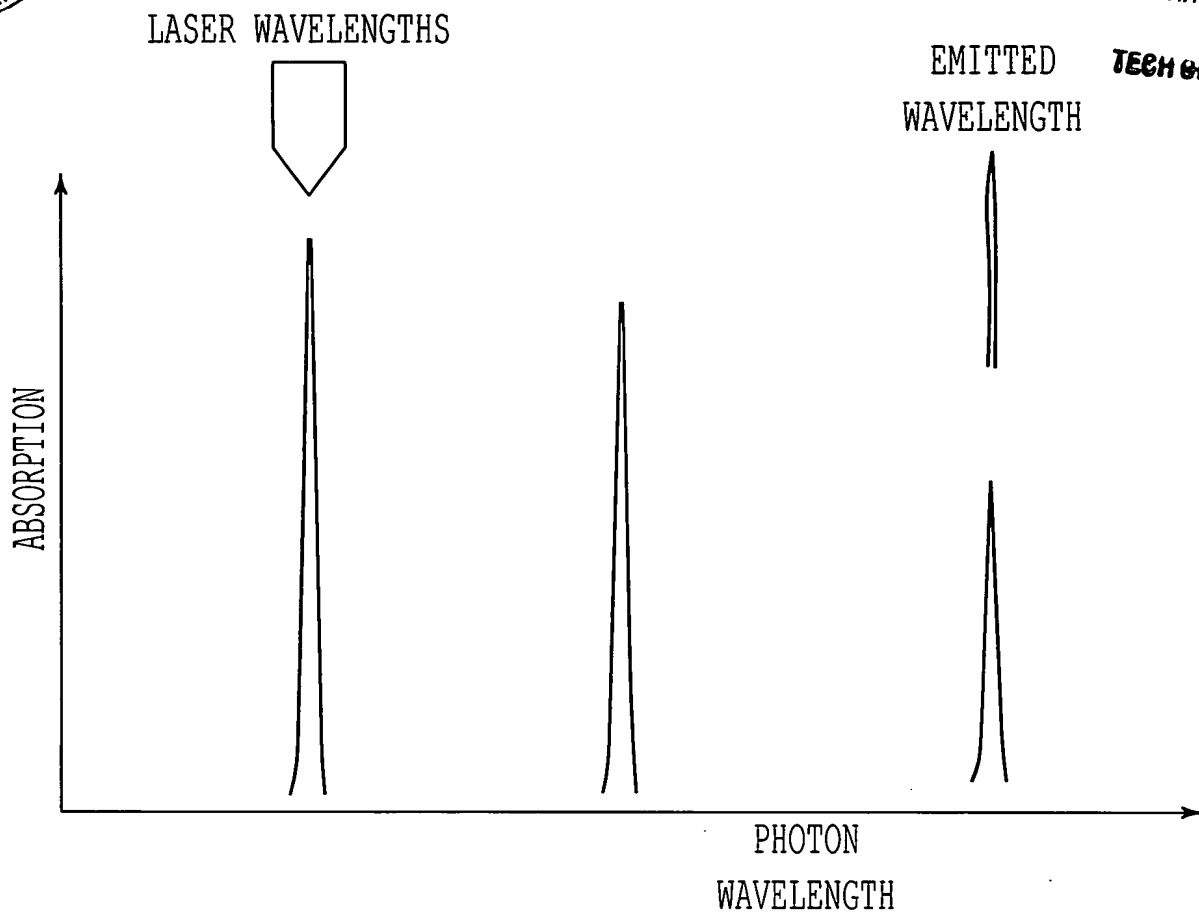


FIG. 6

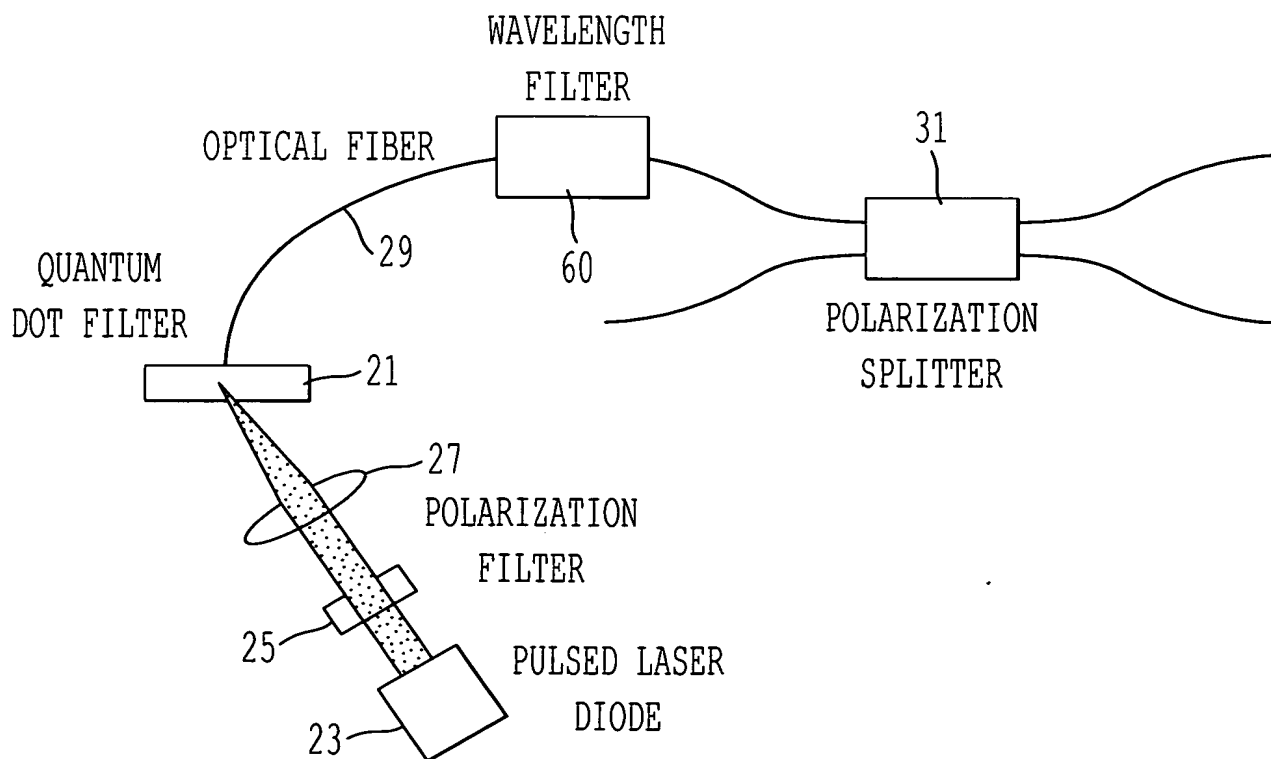


FIG. 7



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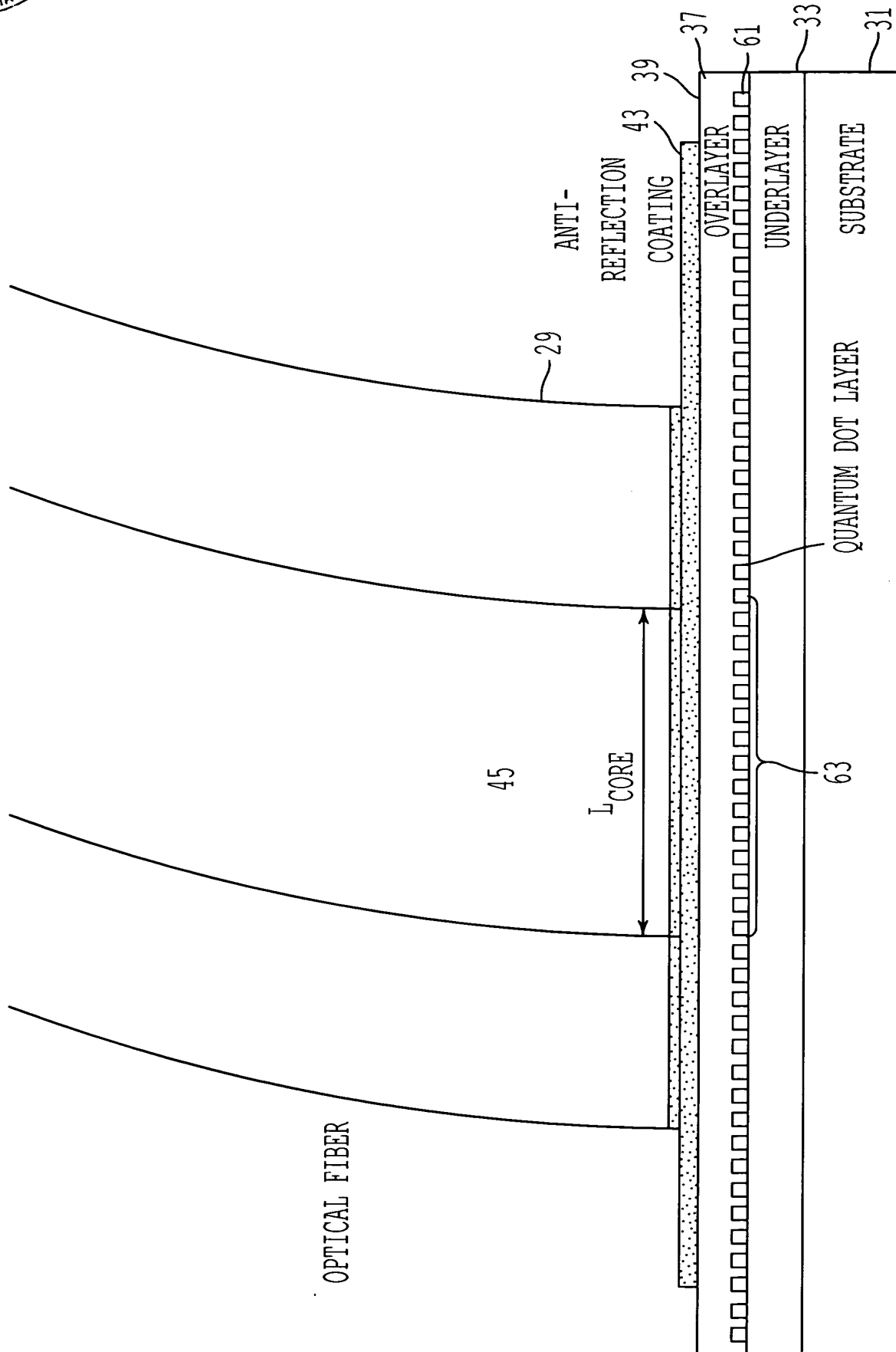


FIG. 8



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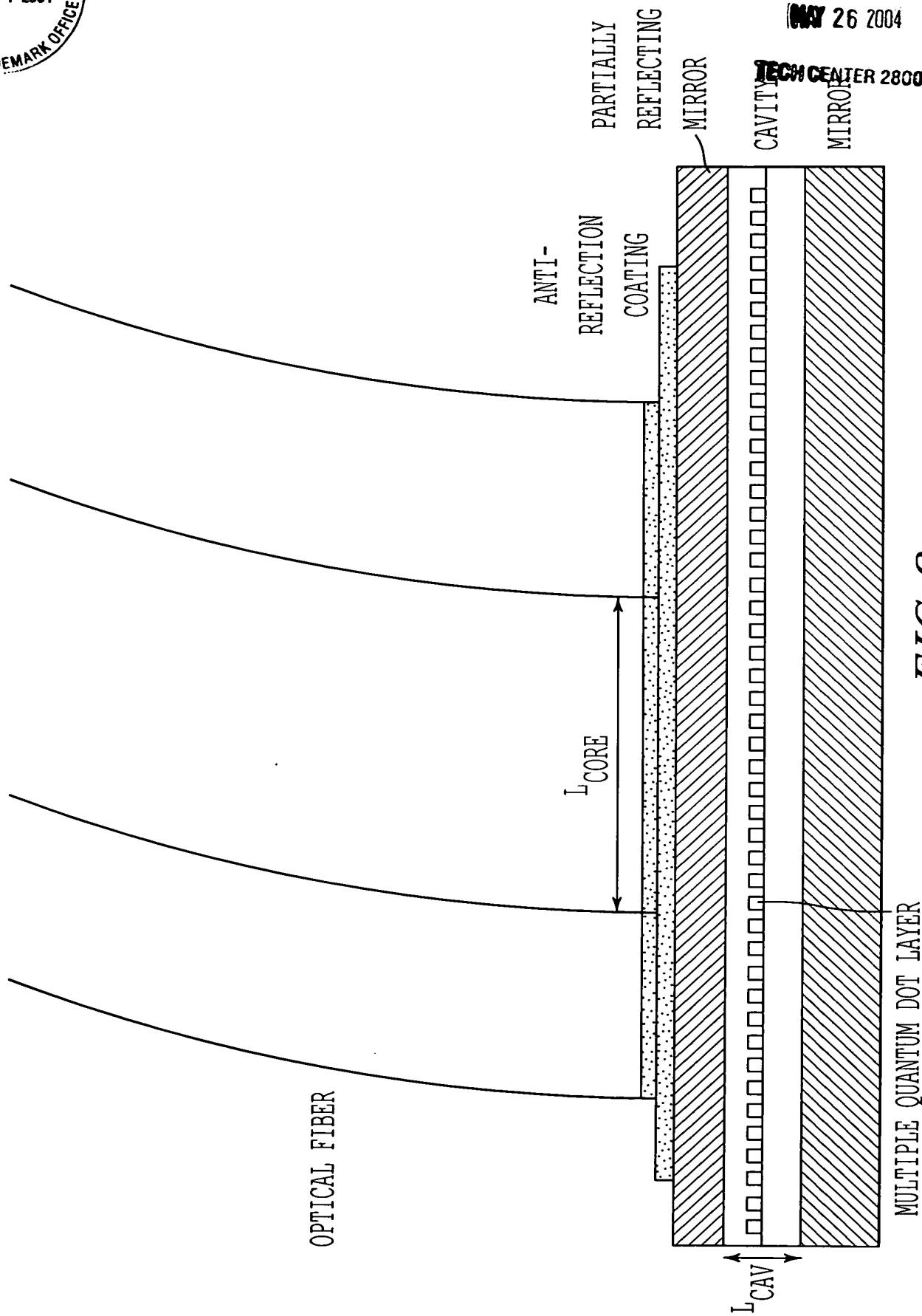


FIG. 9



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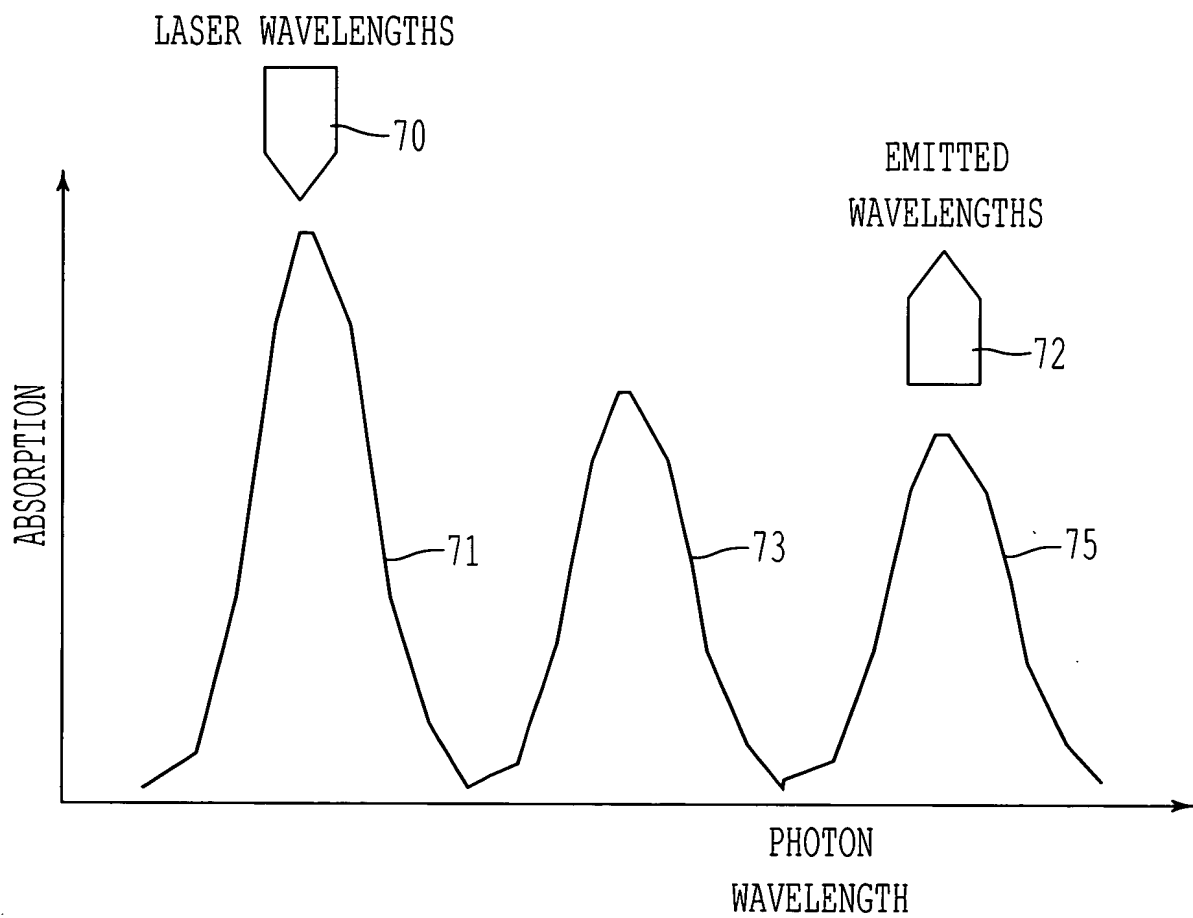


FIG. 10



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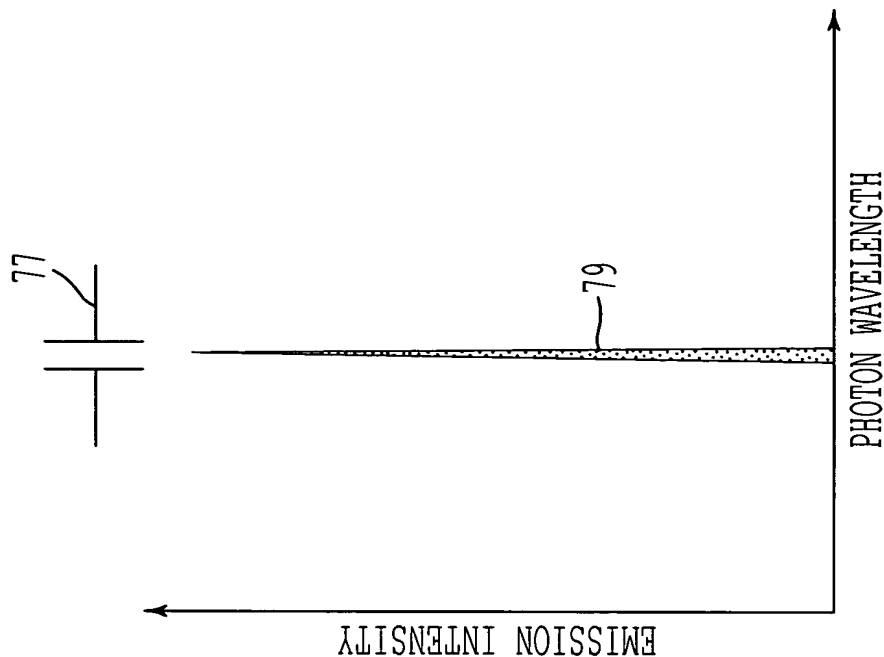


FIG. 11b

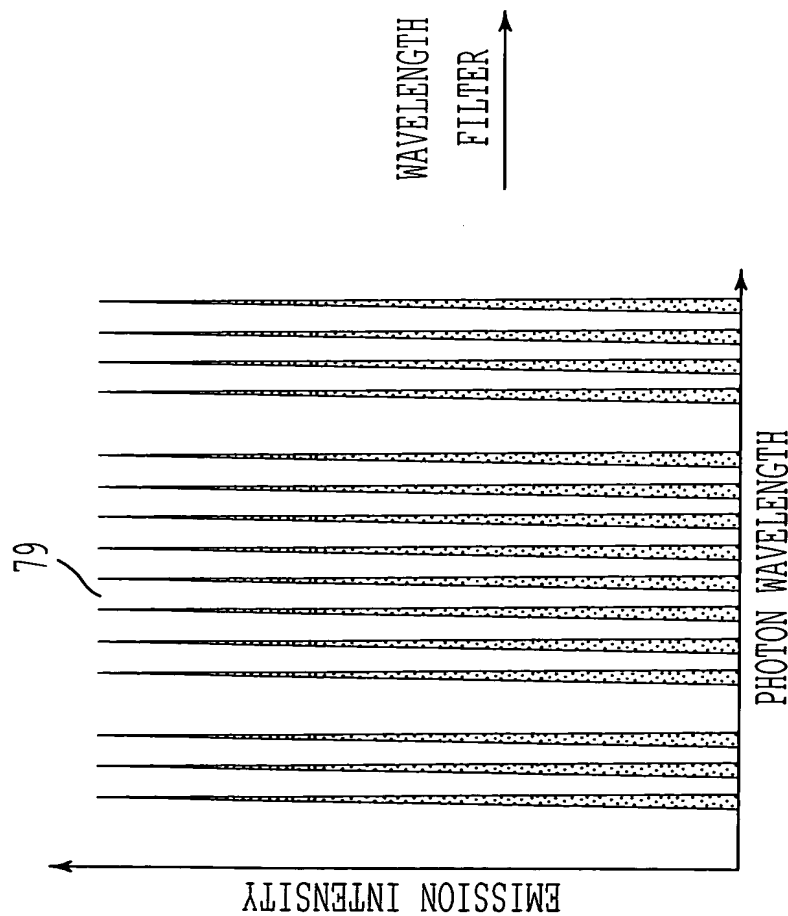


FIG. 11a



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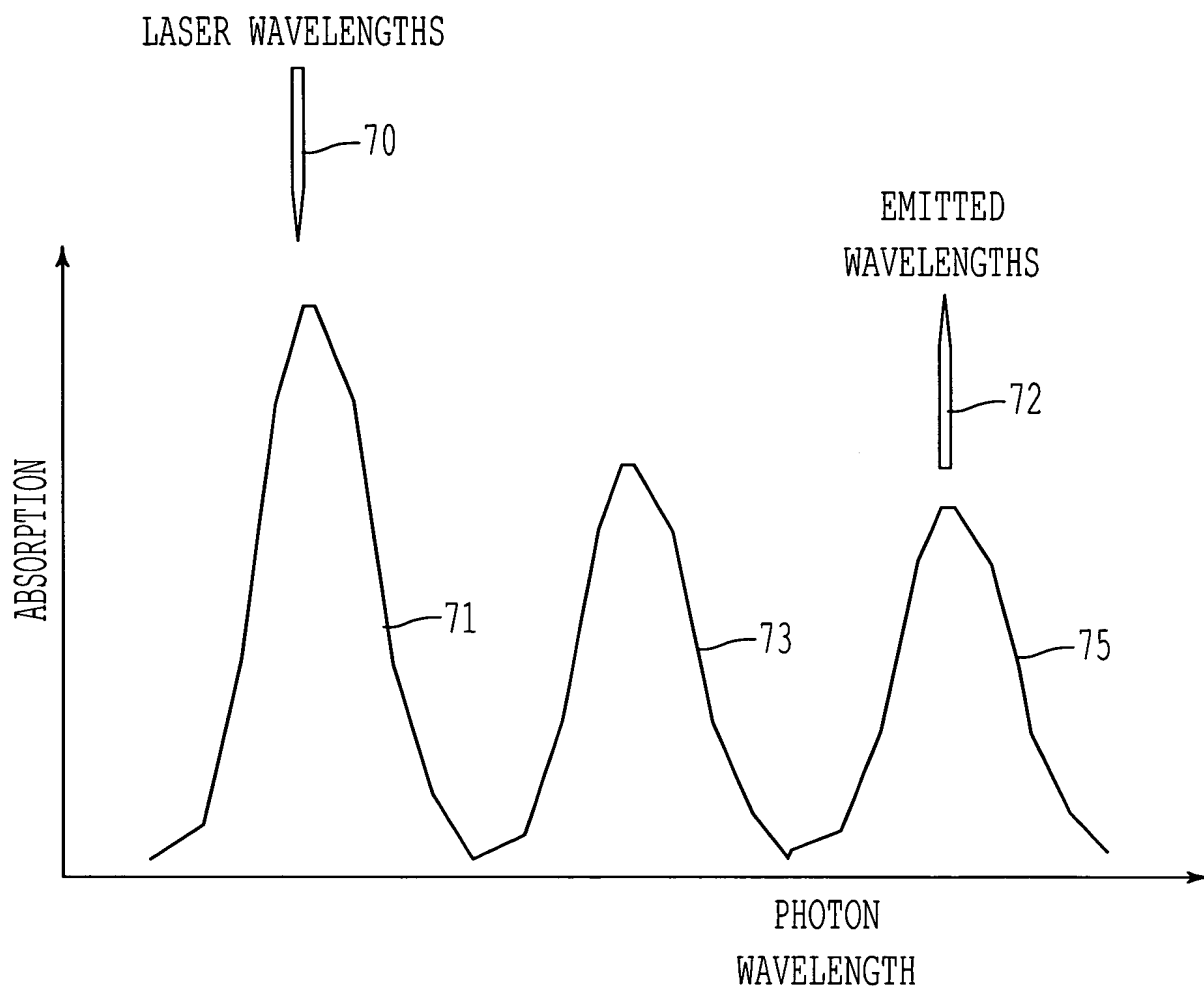
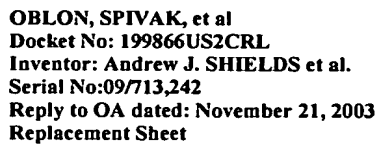


FIG. 12



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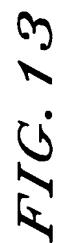


FIG. 13



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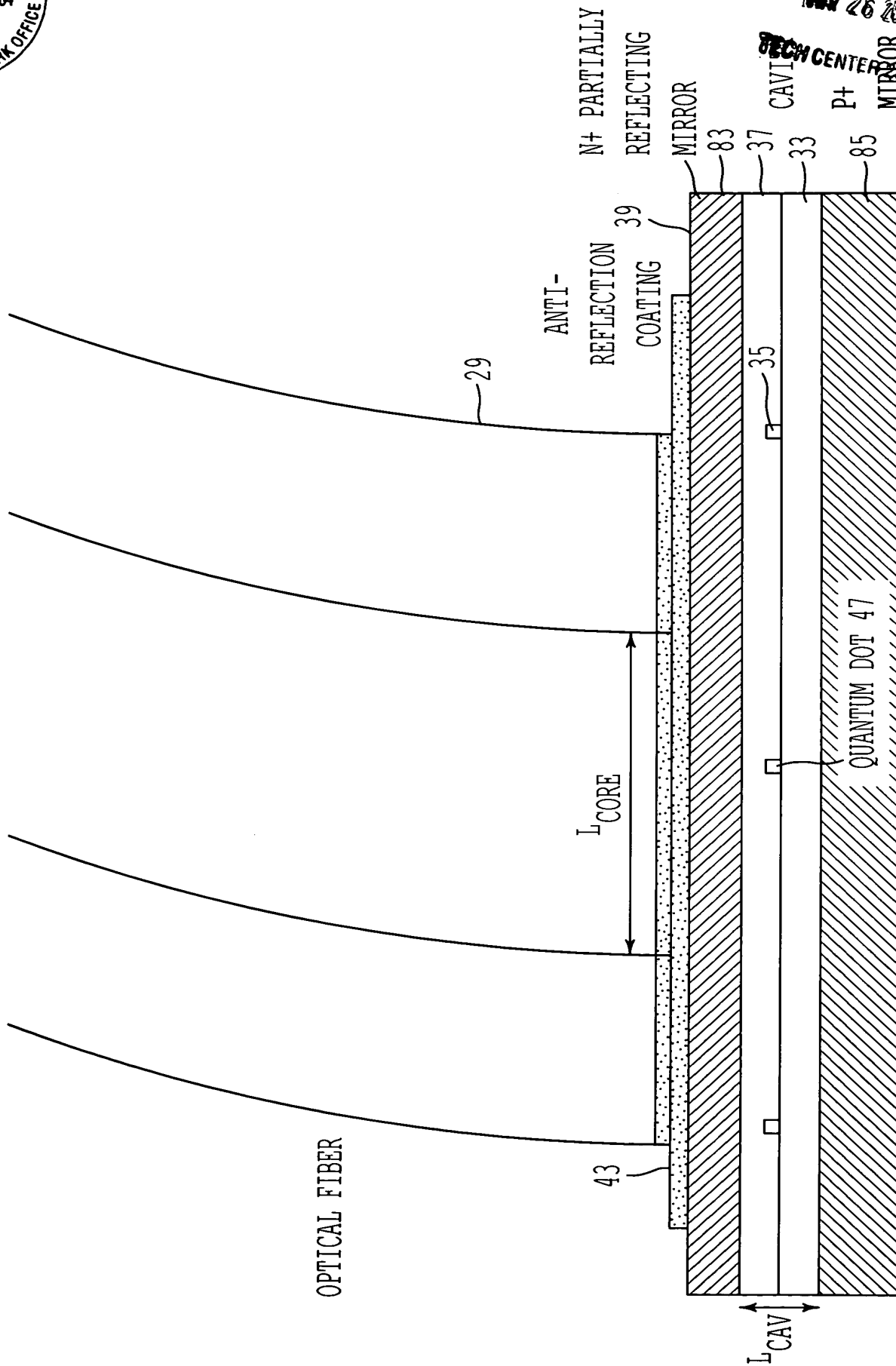


FIG. 14



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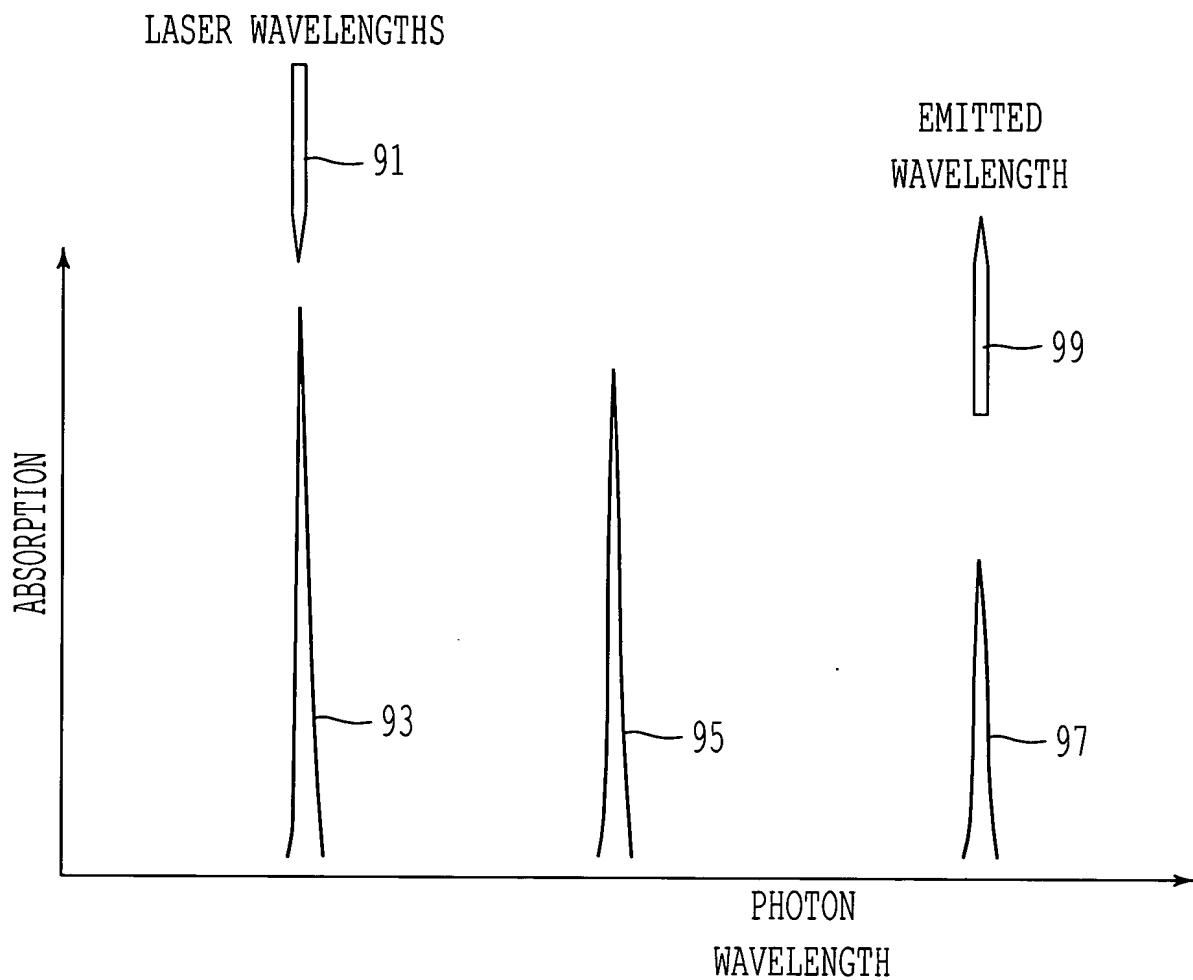


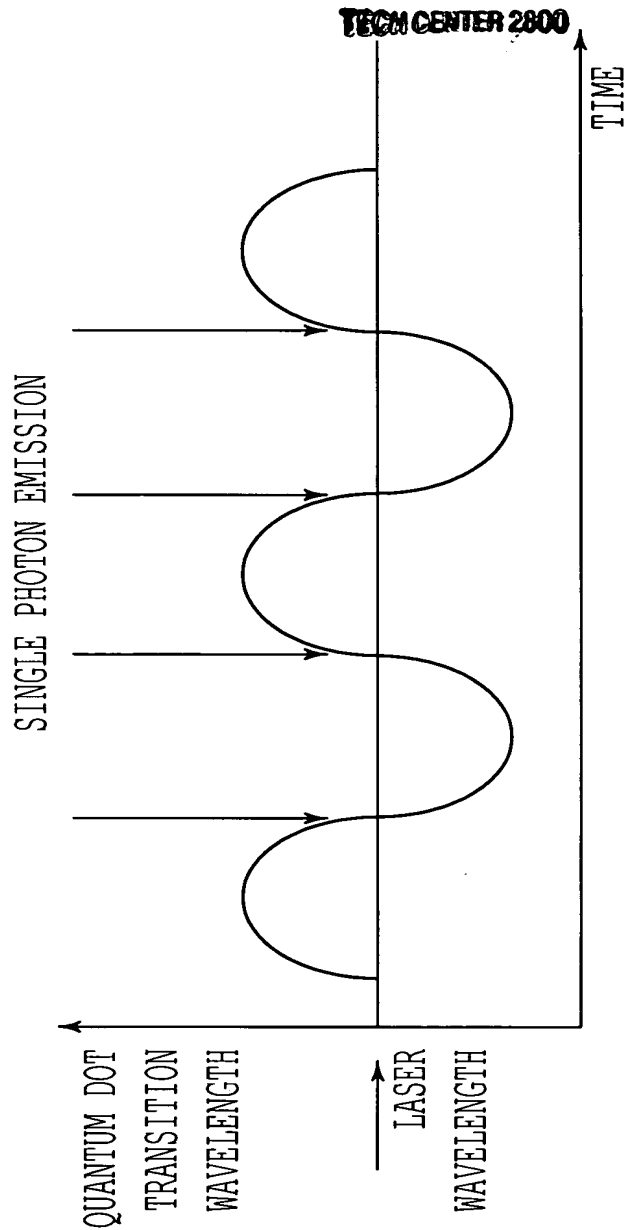
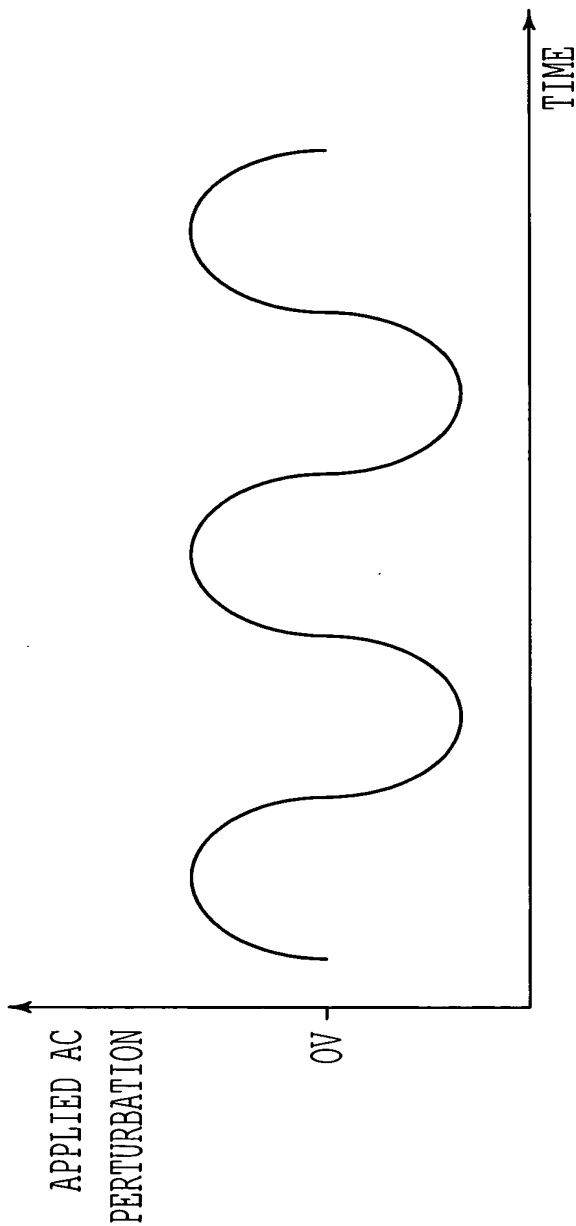
FIG. 15



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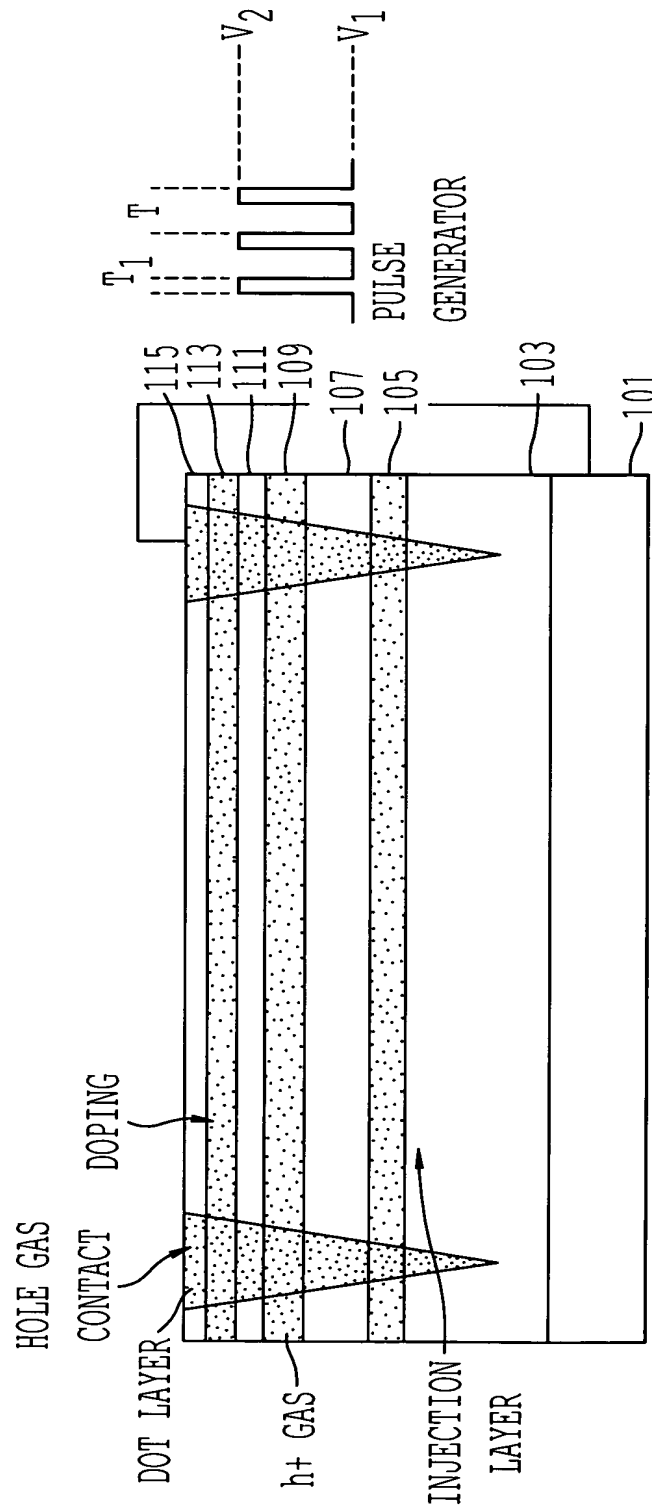


FIG. 17

FIG. 18 is an energy band diagram of a quantum dot device. The diagram shows the conduction band (upper line) and valence band (lower line) across different regions. On the left, a region contains a quantum well (labeled 104) and a quantum dot (labeled 123). The quantum dot is shown as a discrete energy level within the quantum well. A hole gas is indicated in the valence band of the quantum well region. In the center, a tunnel barrier (labeled 105) separates the quantum well from the right region. On the right, an electron injection layer (labeled 121) is shown, which is an N+ doped region (labeled 101). The energy levels in the injection layer are shown to be aligned with the conduction band of the quantum well region. Labels include: QUANTUM DOT, QUANTUM WELL, TUNNEL BARRIER, HOLE GAS, ACCEPTORS, ELECTRON INJECTION LAYER, 101, 104, 105, 121, and 123.

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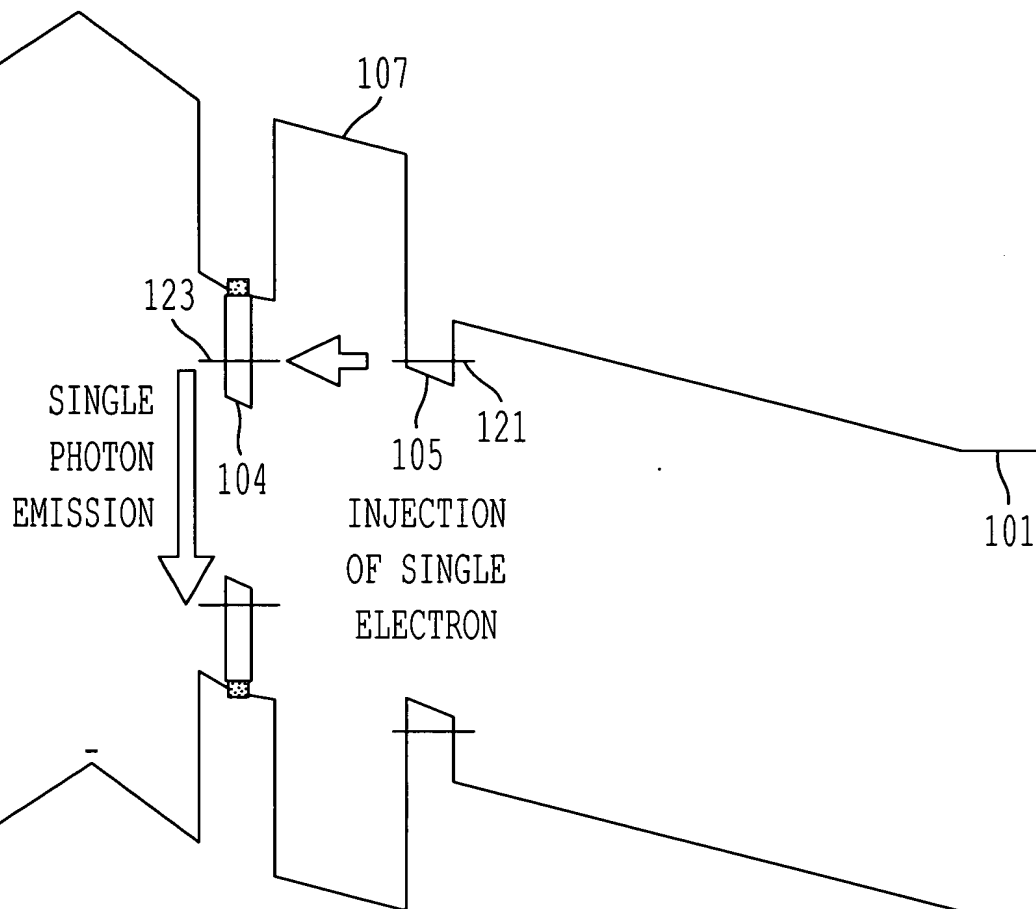


FIG. 19

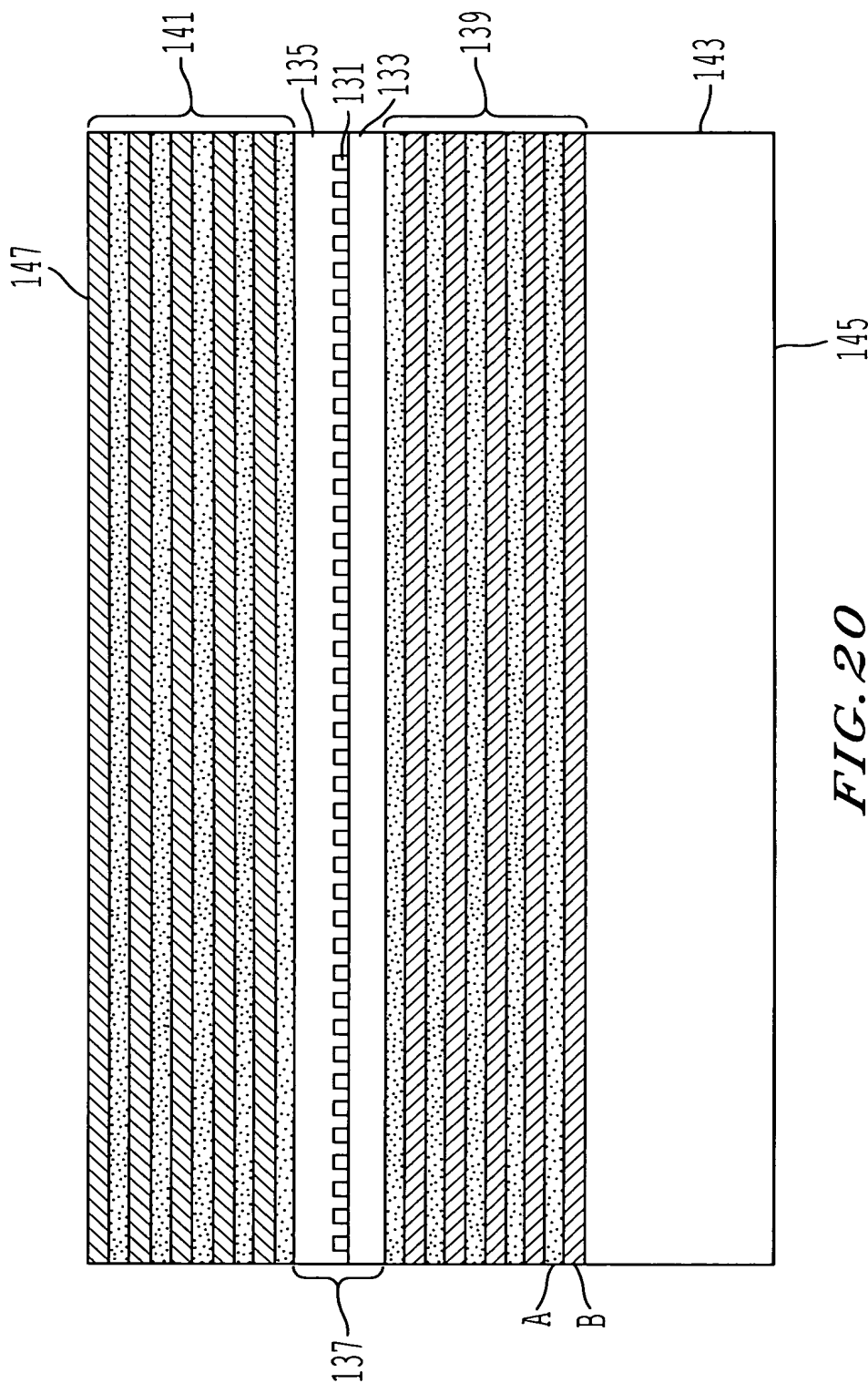
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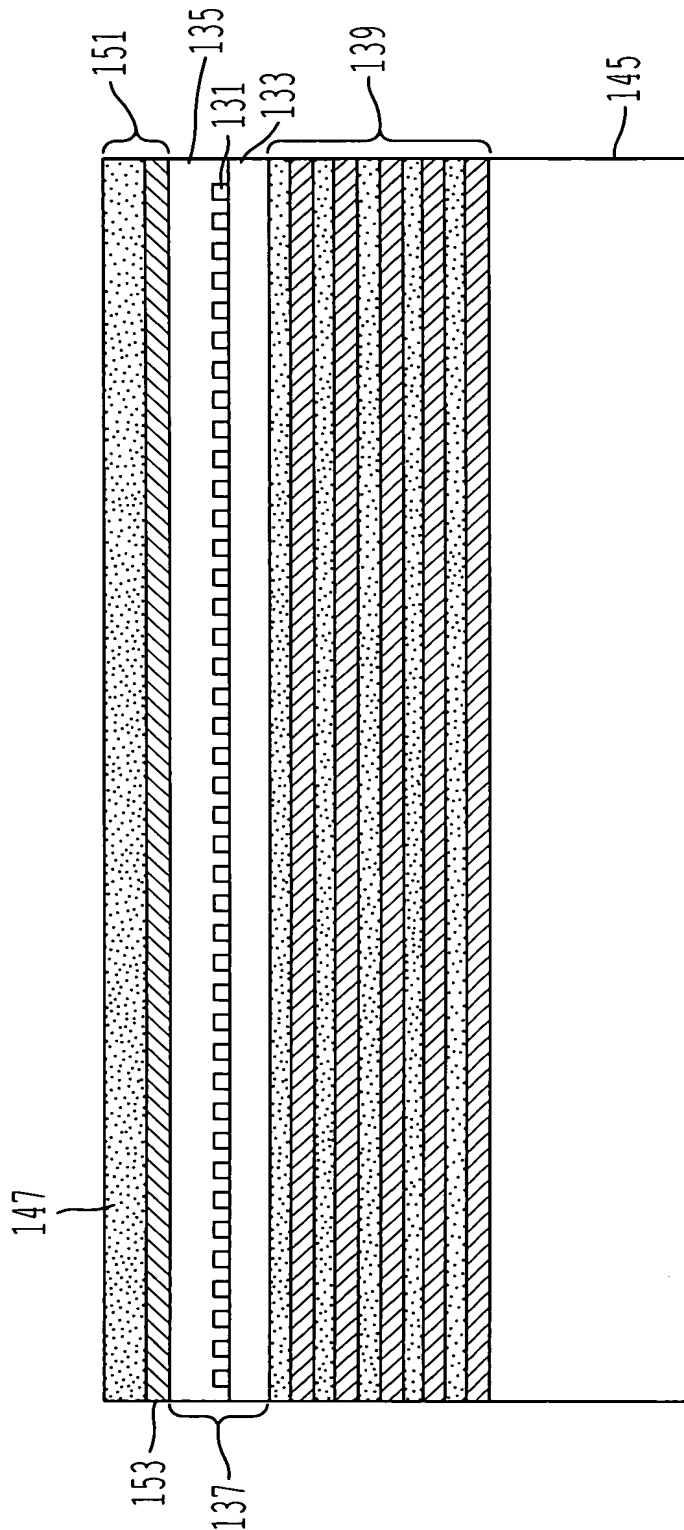


FIG. 21



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ACTIVE QW-REMOTELY DOPED QW CONTAINING
TUNABLE EXCESS ELECTRON DENSITY

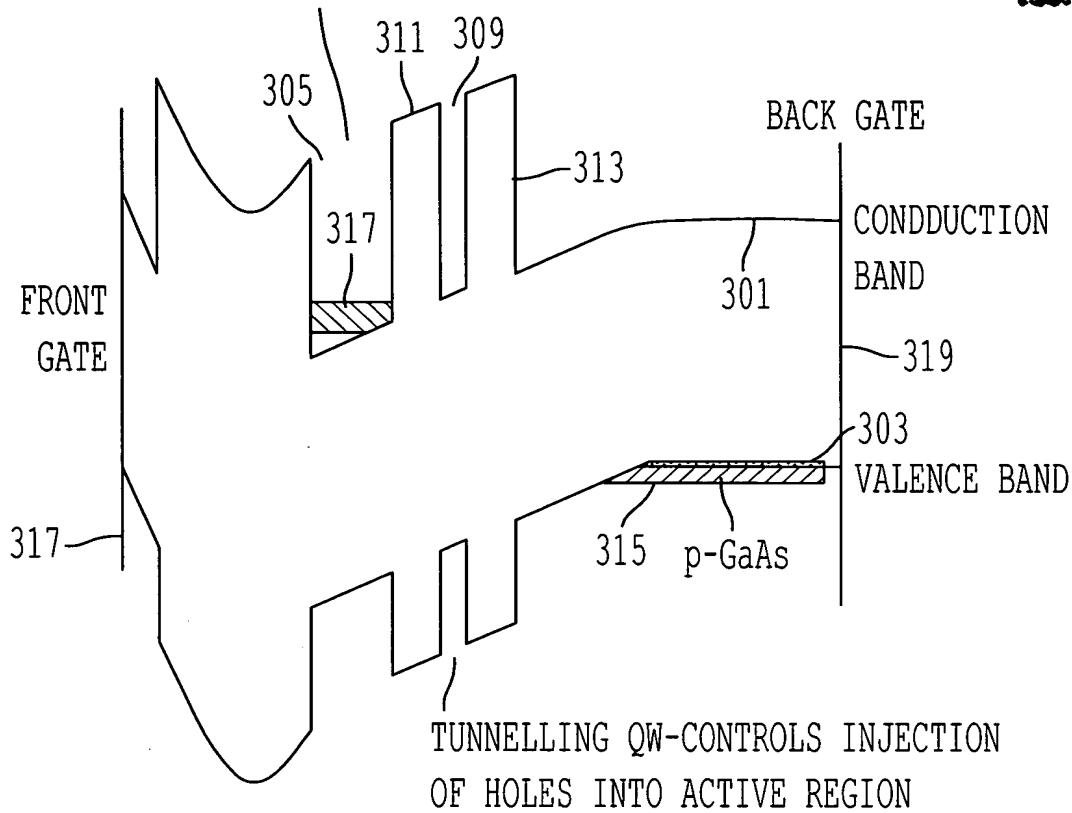
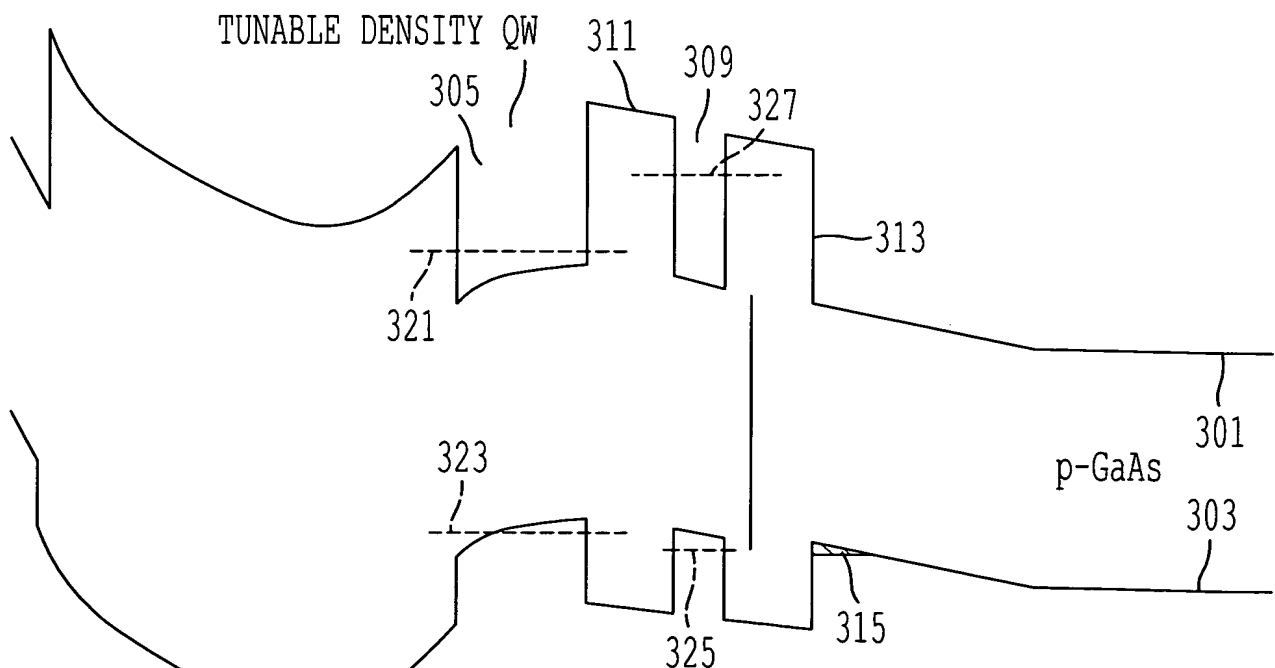


FIG. 22



← HOLE TUNELLING INTO ACTIVE REGION

FIG. 23



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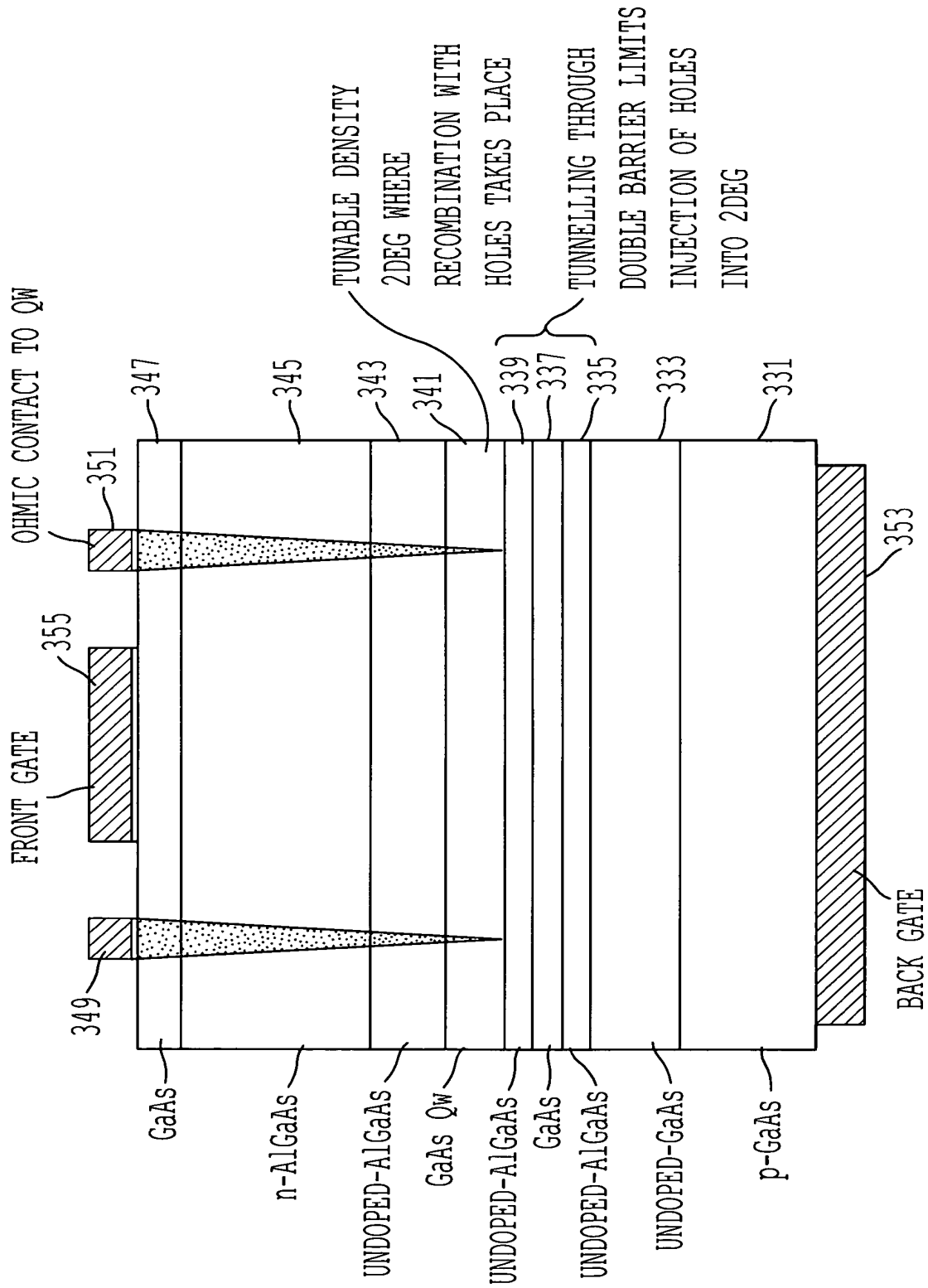


FIG. 24



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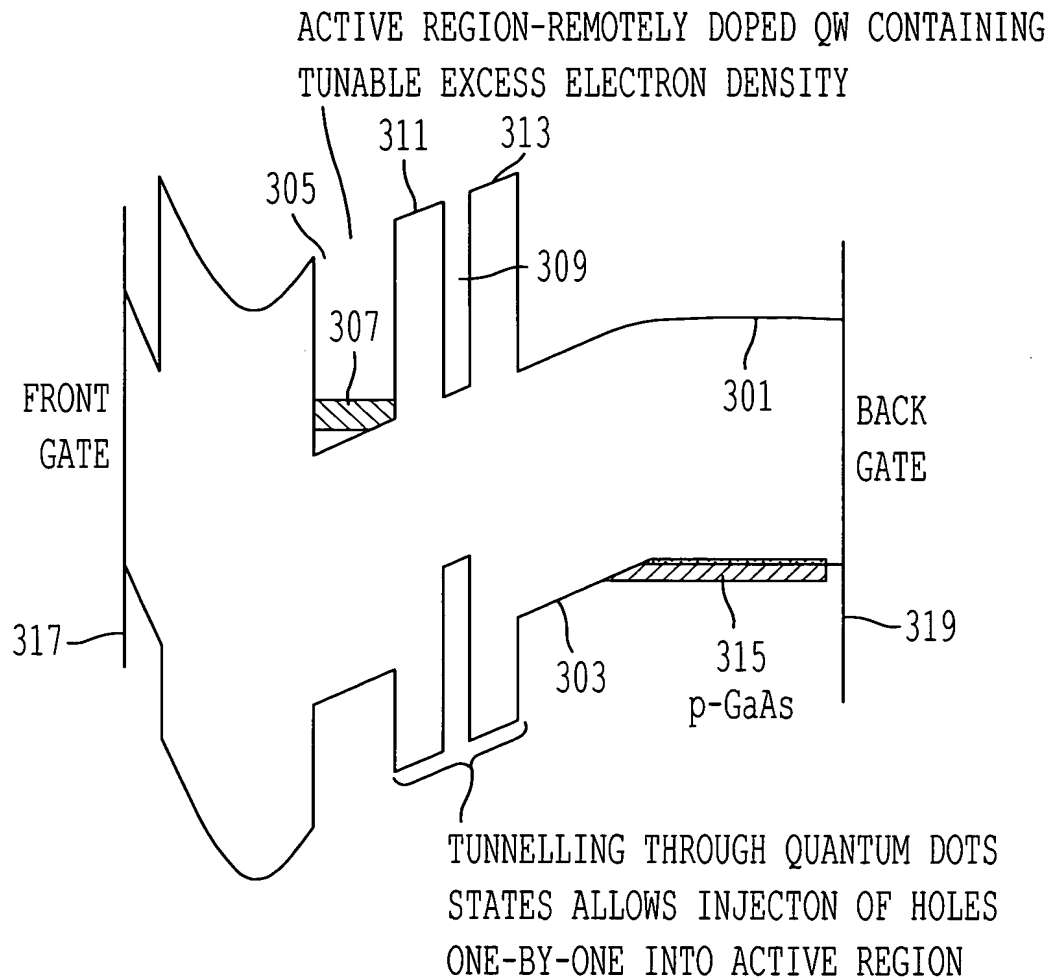


FIG. 25



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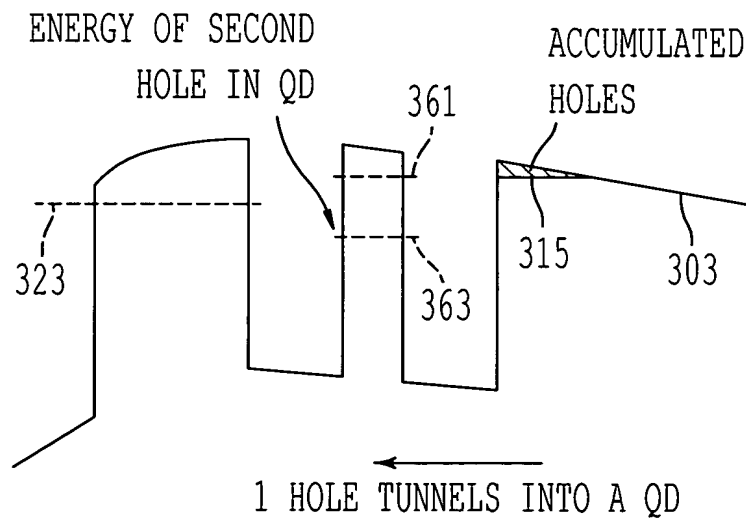
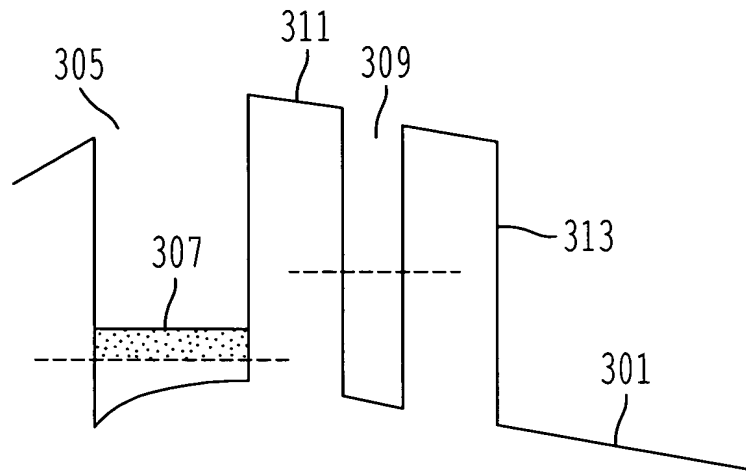


FIG. 26A



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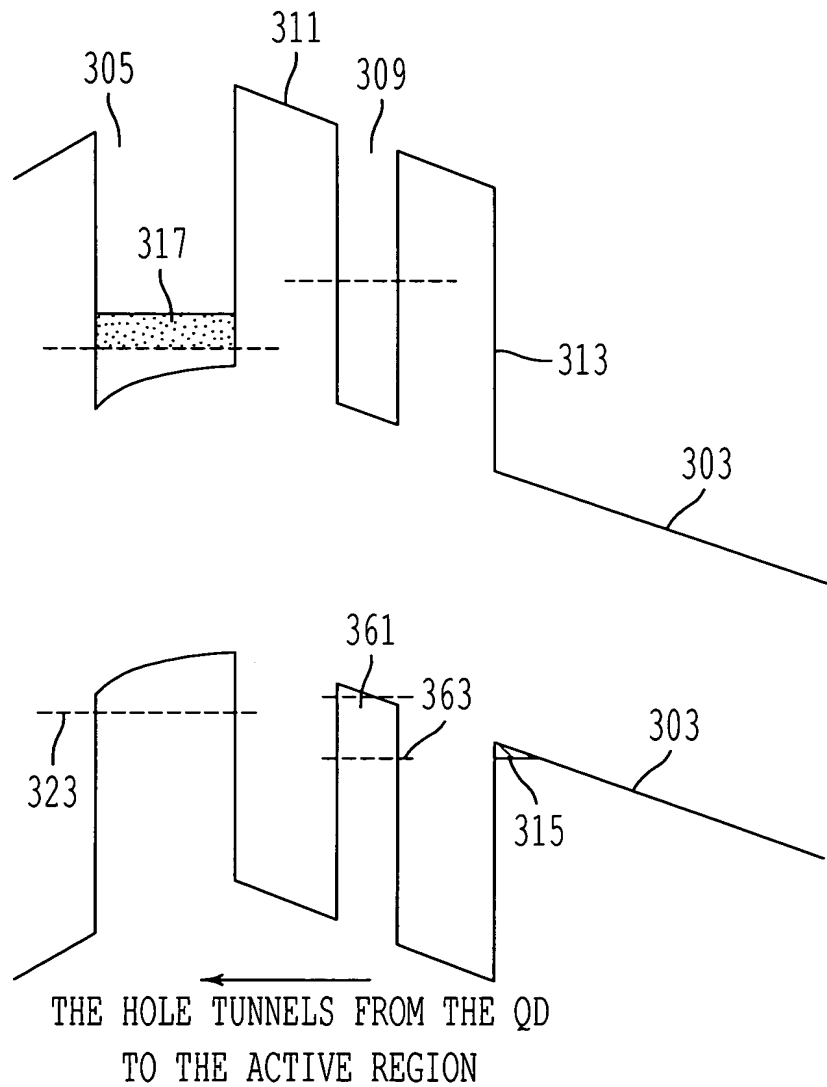


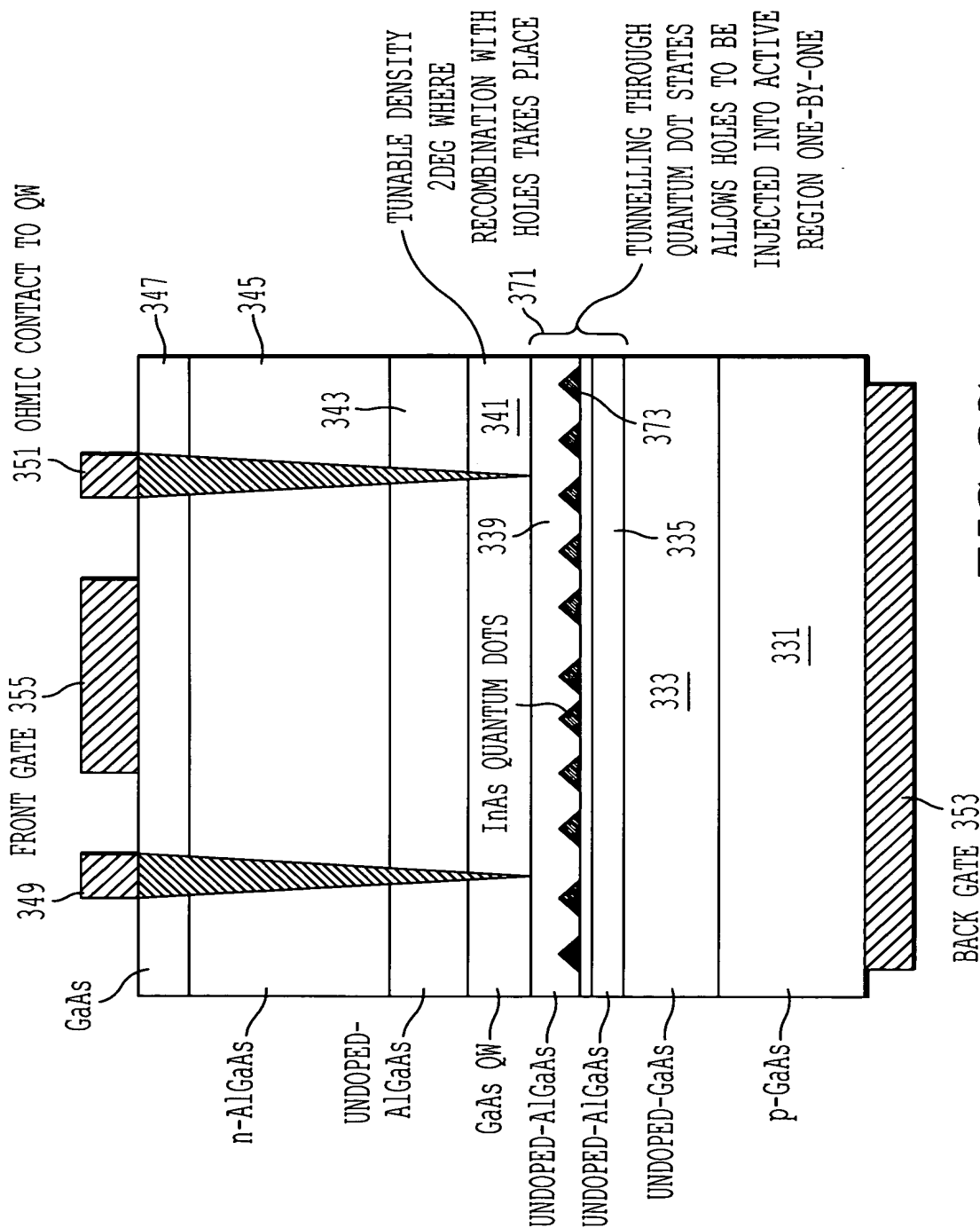
FIG. 26B



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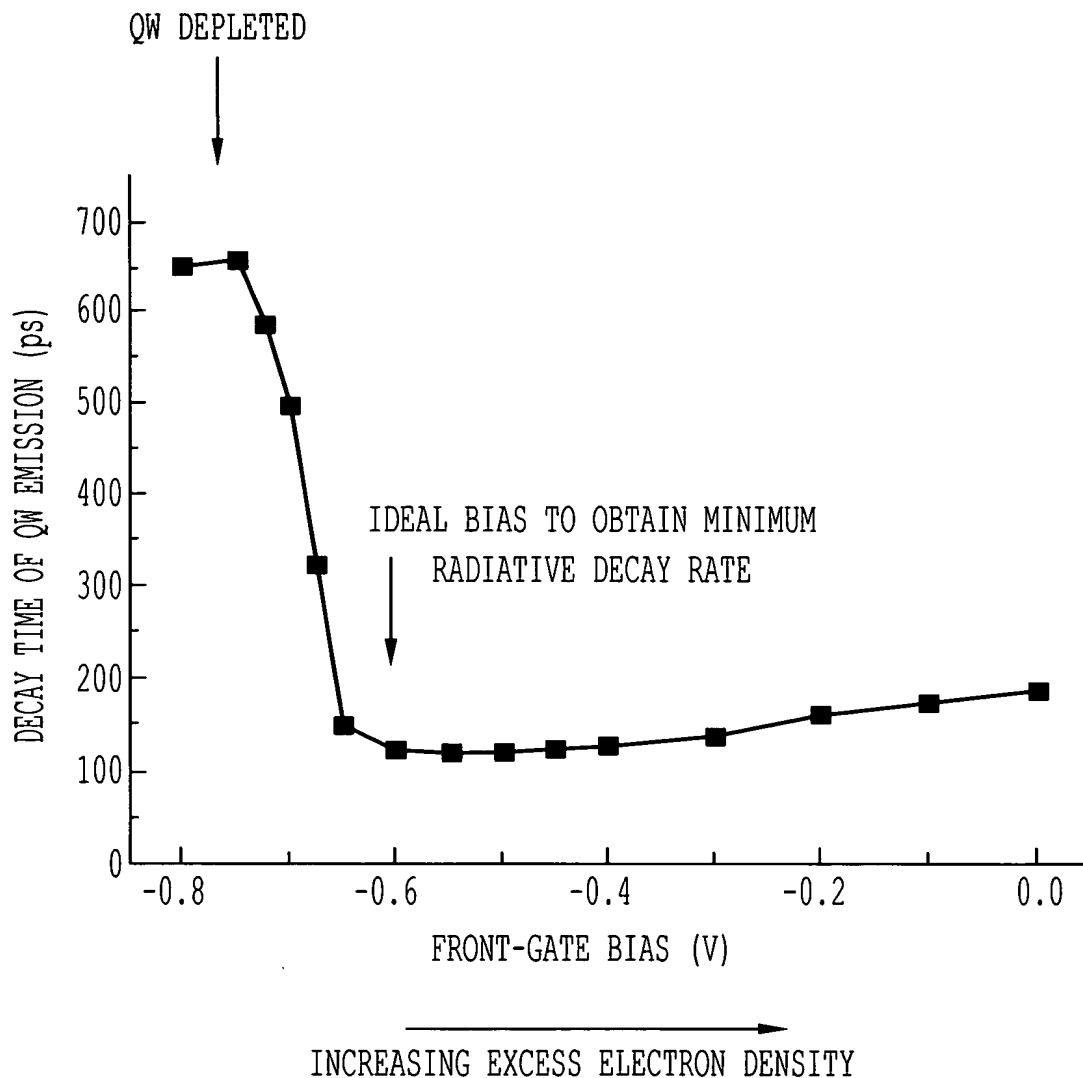


FIG. 28



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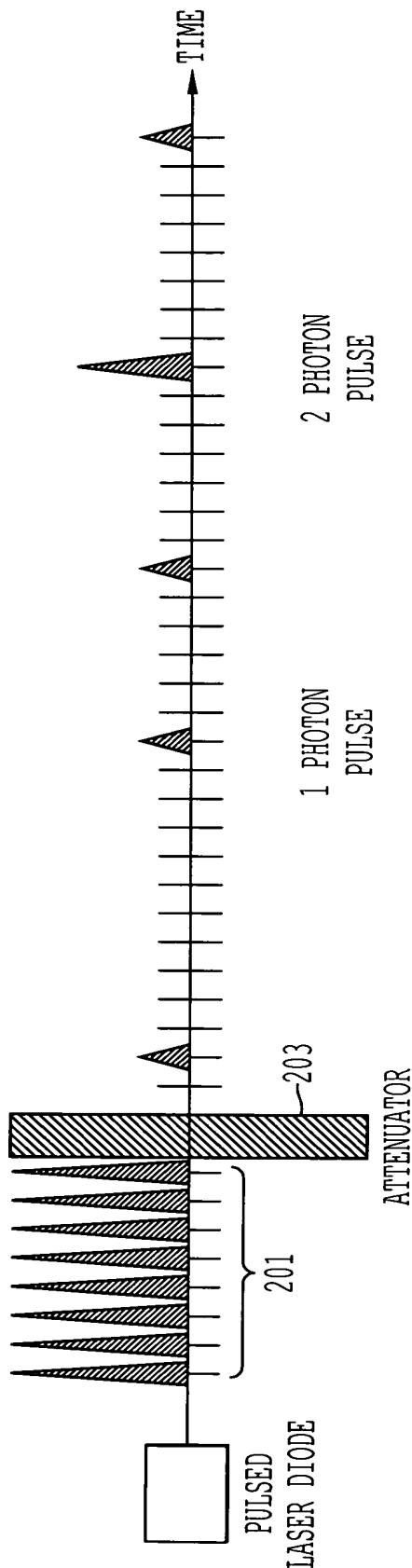


FIG. 29

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